Vaccination coverage among medical residents in Paris, France

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Abstract

Medical residents are particularly exposed to the risk of occupational infection. We aimed to determine the vaccination coverage in residents with an anonymous self-reporting electronic questionnaire. A total of 250 residents took part in this survey. Vaccination rates were particularly high for mandatory vaccinations (diphtheria, tetanus, poliomyelitis, hepatitis B virus and tuberculosis). Regarding recommended vaccinations (influenza, 45.6%; pertussis, 65.2%; measles, 62.8%; varicella, 62.8%), rates were insufficient to prevent hospital epidemics, but higher than those reported in other healthcare workers. Further immunization programmes should target residents, and not only senior healthcare workers, with a critical role for occupational medicine departments.

Keywords: Healthcare professionals, medical education, occupational medicine, residency, vaccine

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Vaccination of healthcare professionals is a critical issue for infection control, not only to protect them from transmissible agents, but also to prevent nosocomial transmission of pathogens. However, achieving high immunization rates among those professionals appears difficult [1].

Little is known regarding the compliance of medical residents with immunization recommendations, although recent data indicate that medical residents seem to have a better knowledge of occupational vaccinations than other healthcare providers [2]. On the other hand, compliance with vaccination appears to be correlated with high quality medical information and advice relating to the benefits of being vaccinated [3].

In France, medical schools and health authorities require that residents should be vaccinated against diphtheria, tetanus, poliomyelitis (dTP), hepatitis B virus (HBV) and tuberculosis (BCG), and recommend vaccination against influenza, pertussis, varicella and measles. These vaccinations are proposed free of charge to every resident by occupational medicine departments in French hospitals.

Medical education in France consists of 6 years of graduate study in medical school, followed by a residency programme of 4–5 years (depending on the medical specialty). Residents spend this period in various hospitals, with a minimal period of 6 months (semester) in each department, and represent a population particularly at risk of vaccination-preventible diseases due to their contribution to emergency wards during the winter wave of influenza.

We aimed to evaluate vaccination coverage rates in medical residents. An anonymous self-reporting questionnaire was electronically administered to 963 residents affiliated to the association of junior doctors of Paris (Syndicat des Internes des Hôpitaux de Paris (SIHP)), concomitantly with another questionnaire on accidental blood exposures [4]. The questionnaire was available online for a 1-month period at the end of 2008. A total of 250 medical residents (26.0%) filled in the questionnaire. The main characteristics of the responding population are summarized in Table 1, and data on immunization status are shown in Table 2.

Regarding diseases frequently involved in nosocomial epidemics, 81 residents (32.4%) had a past history of measles during childhood, and 157 (62.8%) reported having received at least one dose of measles vaccine (34 received two shots). Nevertheless, 60 residents (24%) without a past history of measles were not vaccinated. Regarding influenza vaccination, 114 (45.6%) had been vaccinated during the past year and 164 (65.6%) the year before. The majority of residents were vaccinated at their site of work: 63 (55.3%) at occupational medicine departments, and 39 (34.2%) in their unit. Five (4.4%) reported self-vaccination and seven (6.1%) received vaccination from their treating physician. Reasons for vaccination or non-vaccination are detailed in Table 3. Importantly, 201 (80.4%) declared that they were willing to receive vaccination for the next influenza season, and 185 (74%) recommended vaccination to their relatives.

TABLE 1. Characteristics of the responding population (*n* = 250)

Characteristic	*n* (%)
Gender	
Male	81 (32.4)
Female	169 (67.6)
Specialty	
Medical	106 (42.4)
Anaesthesiology	24 (9.6)
Surgery/obstetrics	74 (29.6)
Paediatrics	29 (11.6)
Laboratory	11 (4.4)
Without contact with patients (public health)	6 (2.4)
Reporting having children	41 (16.4)
Reporting having a vaccination booklet	200 (80)
Characteristic	**Median (range)**
Age (years)	27 (23–35)
Seniority at the time of the study (semester)	6 (0–10)

TABLE 2. Immunization rates for the responding population (*n* = 250)

Disease	Residents vaccinated, *n* (%)
Measles	
At least one shot	157 (62.8)
Two shots	34 (13.6)
Influenza	
Season 2008–2009	114 (45.6)
Season 2007–2008	164 (65.6)
Hepatitis B	250 (100)
Tuberculosis	246 (98.4)
Diphteria, tetanus, poliomyelitis (up to date)	242 (96.8)
Pertussis	163 (65.2)
Varicella	22 of 35 (62.9)

Regarding severe diseases sometime contracted by the healthcare workers, all responders reported previous vaccination against HBV, and 198 (79.2%) had previously controlled their anti-HBs antibody titers. Four residents (1.6%) were uncertain of their vaccination status against tuberculosis.

Regarding other vaccinations, all but eight residents (3.2%) were up to date for dTP (last booster dose <10 years). One hundred and sixty-three residents (65.2%) had been vaccinated against pertussis with a booster dose received after the age of 19. Forty-nine (19.6%) had previously faced a pertussis epidemic during their medical training, of whom 30 (61.2%) were up to date for pertussis vaccination (p 0.65). Two hundred and fifteen residents (86%) reported a history of varicella during childhood. Of the 35 remaining residents, 22 (62.9%) had been vaccinated and 12 (34.3%) had controlled their serology. Eighty-four residents (33.6%) reported having been in charge of patients at high risk of severe varicella infection. Finally, immunization coverage for other vaccines was as follows: typhoid fever, 116 residents (46.4%); hepatitis A virus, 124 (49.6%); yellow fever, 74 (29.6); meningococcus, 35 (14%).

To date, very few studies have addressed the question of vaccination coverage in medical residents, with the most studied issue being influenza vaccination [5–8].

A low vaccination coverage against influenza has been previously reported in medical residents [2,9], although this coverage is higher than in other healthcare workers [2]. In the present survey, the main reason for non-vaccination against influenza was the lack of time, in contrast to previous studies reporting the perception of a low risk of contracting influenza as the most common reason for vaccine refusal [9]. Over a 2-year period, we found vaccination coverage of 45.6% and 65.6% in medical residents, in the same range as that observed in a previous study in the USA [7]. Frequent reasons for vaccination included self-protection and protection of patients, but also recommendations from health authorities. Indeed, recent nosocomial epidemics in France have stressed the need for a better vaccination coverage of healthcare workers [10,11]. Side-effects and inefficacy were not important concerns for residents, while these reasons seem more prevalent in nurses and senior physicians [2].

Moreover, a majority of residents were vaccinated at the hospital, with a critical role for occupational medicine departments.

Another important finding of the present survey is the high vaccination coverage against dTP, HBV and tuberculosis. On the other hand, 65.2% of residents had been vaccinated

TABLE 3. Self-reported reasons for influenza vaccination or non-vaccination in residents (*n* = 250) during the 2007–2008 season

Vaccinated		Non-vaccinated	
Reasons: *n* (%)	***n* = 114**	**Reasons: *n* (%)**	***n* = 136**
Due to my personal medical history	5 (4.4)	Fear of side-effects	13 (9.6)
To protect myself	68 (59.6)	The vaccine is inefficient	14 (10.3)
To protect my relatives	25 (21.9)	I have a contraindication	8 (5.9)
To protect my patients	78 (68.4)	I don't have time	72 (52.9)
Because it is recommended by health authorities	67 (58.8)	I am not at risk for influenza	7 (5.1)
Because it is promoted in my unit	26 (22.8)	Influenza is not a severe disease	3 (2.2)
Because of the media promotion campaign	2 (1.8)	Inadequate organization in my hospital	8 (5.9)
		I am not in contact with patients this semester	22 (16.2)

against pertussis and 62.8% against measles, which is not enough to avoid hospital epidemics, in particular in the context of recent epidemics affecting European countries [12].

Medical residents represent a population at risk of transmitting vaccine-preventable diseases to potentially high-risk patients, and are concerned by immunization recommendations for healthcare workers. They have higher vaccination rates for recommended vaccinations than senior healthcare workers, and should therefore benefit from targeted prevention programmes. Specific attention should be paid to influenza vaccination, because a lack of time was given as a reason by 52.9% of non-vaccinated residents.

Because the lack of time represents a major barrier to vaccination, time gaps dedicated to vaccination should be considered by heads of departments in order to improve vaccination coverage in this population.

Transparency Declaration

The authors have no conflict of interests to declare.

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